APPLICATION OF THE CAVITY RING-DOWN TECHNIQUE TO WATER VAPOUR CONTINUUM MEASUREMENTS

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The water vapour "continuum" is a weak and unstructured absorption which spans the infrared spectrum. In the 8-13 μm atmospheric window it is a major factor in the radiative transfer of the lower atmosphere to space, and therefore has implications in the area of climate change. Theoretical models of the water vapour continuum are based on data which contain uncertainties and are sometimes inconsistent. The major reasons for this are the small size of the absorption coupled with the low saturated vapour pressure of water at atmospheric temperatures, which limits the total absorption in any conceivable laboratory path.

Recognising the need for improved continuum measurements, we are currently developing a cavity ring-down experiment, in order to study the water vapour continuum. This paper will discuss the design of the experiment, the expected performance, and the manner by which an acceptable signal-to-noise ratio can be obtained.